Energy Efficient Schools Initiative

Public Chapter 1188
Of 105th General Assembly

Program Highlights

- Creates a sustainable K-12 capital outlay program for existing retrofits and new construction.
- Will promote technologies and guidelines in retrofits and new construction that will save systems money over the life of the building.
- Creates opportunities for partnerships with world class institutions with high levels of technological expertise (ORNL & TVA).

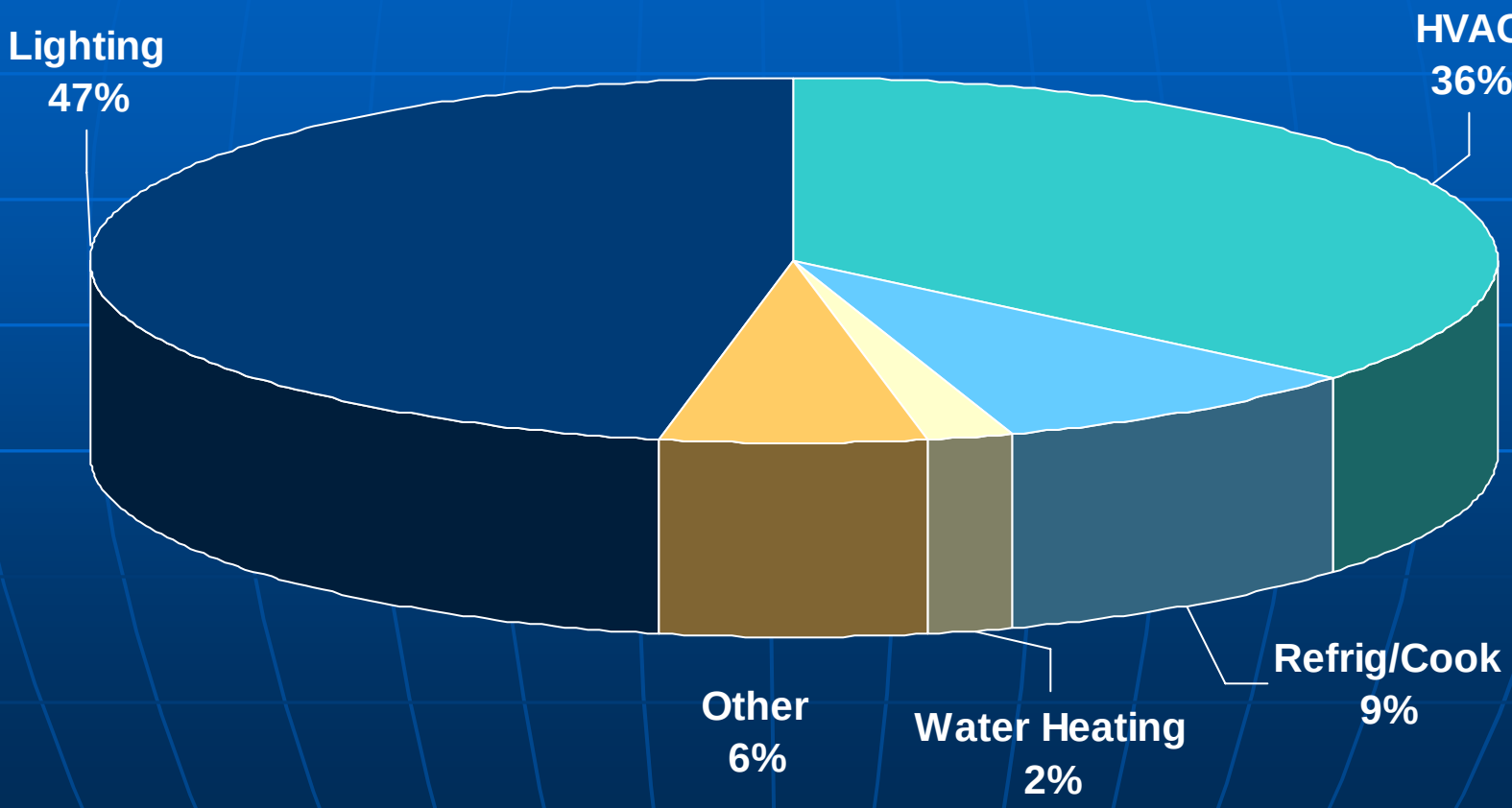
- **Puts Tennessee on the forefront of energy technology and conservation.**

What's Out There?

- Estimated electric and gas cost of approximately $155 million for the 1,714 school buildings and 136 school systems in Tennessee.

- The most conservative assumptions show we could save 5% annually on these costs -- $7.5 million per year.

K-12 Electricity Use by End-Use



Potential Projects

- High Efficiency Lighting
- HVAC Upgrades
- Energy Manager
- Warranted pre-determined energy use objectives

High Efficiency Lighting Retrofit

- "Low-hanging fruit"
  - Typically highest benefit to cost and shortest payback period.
  - Could be done as stand-alone

- Costs and Benefits:
  - Estimated 500 schools completed upgrades
  - Estimated 1,200 schools need upgrades
  - Approximately $50,000 per building
  - Typically save 10-15% of capital cost (or $6 to 9 million per year)
  - Payback period is between 6 and 10 years

HVAC Upgrades

- Could potentially be the most cost saving upgrade for many buildings
- Common types of systems (from least efficient to most efficient):
  - Window units
  - Roof-top A/C with Gas Heat
  - Closed Loop Heat Pump
  - Geothermal Heat Pump
- Costs and Benefits:
  - Upfront costs range from under $1 million to almost $2 million on average
  - On average school, annual operating costs could be cut in half depending on system employed
  - Payback period ranges from 7 to 11 years

Energy Manager Program

- Ongoing support personnel to modify energy use behaviors to maximize benefit.
- Currently in use in some school systems.
- Reasonable estimates believe 20 Managers can cover 50% of all buildings
- Costs and Benefits:
  - Program can initially be paid for out of savings from lighting and HVAC retrofits (NO incremental cost!!)
  - Estimated to save 9% off baseline costs per school or potentially $7 million.

Pre-determined Energy Use

- Performance based energy accountable construction processes.
- Projects will be eligible if a provider is willing to guarantee a pre-determined energy use objective.

New Construction

- Ensure new school buildings are equipped with best long-term technology available.
- Evidence shows that cost and budget restrictions often prevent these cost saving investments.
- Costs and Benefits:
  - Incremental costs per building of $600,000 on average for 20 to 35 buildings annually
  - Total Cost of $11 to $20 million annually
  - Conservative estimates of $60,000 in savings annually per building
  - Total savings of $1.2 to $2.1 million annually.

The Council Members

- Stakeholders in the system
  - Either the funding parties, the building users, those that build and design the buildings, or the relevant Commissioners.
  - TVA and ORNL are ex-officio, non-voting.
- Balanced representation in both expertise and required to be representative of the racial and social makeup of the state.
- Receive no compensation
- Will be monitored for conflicts of interest
- Have authority to hire Executive Director and other staff they need.

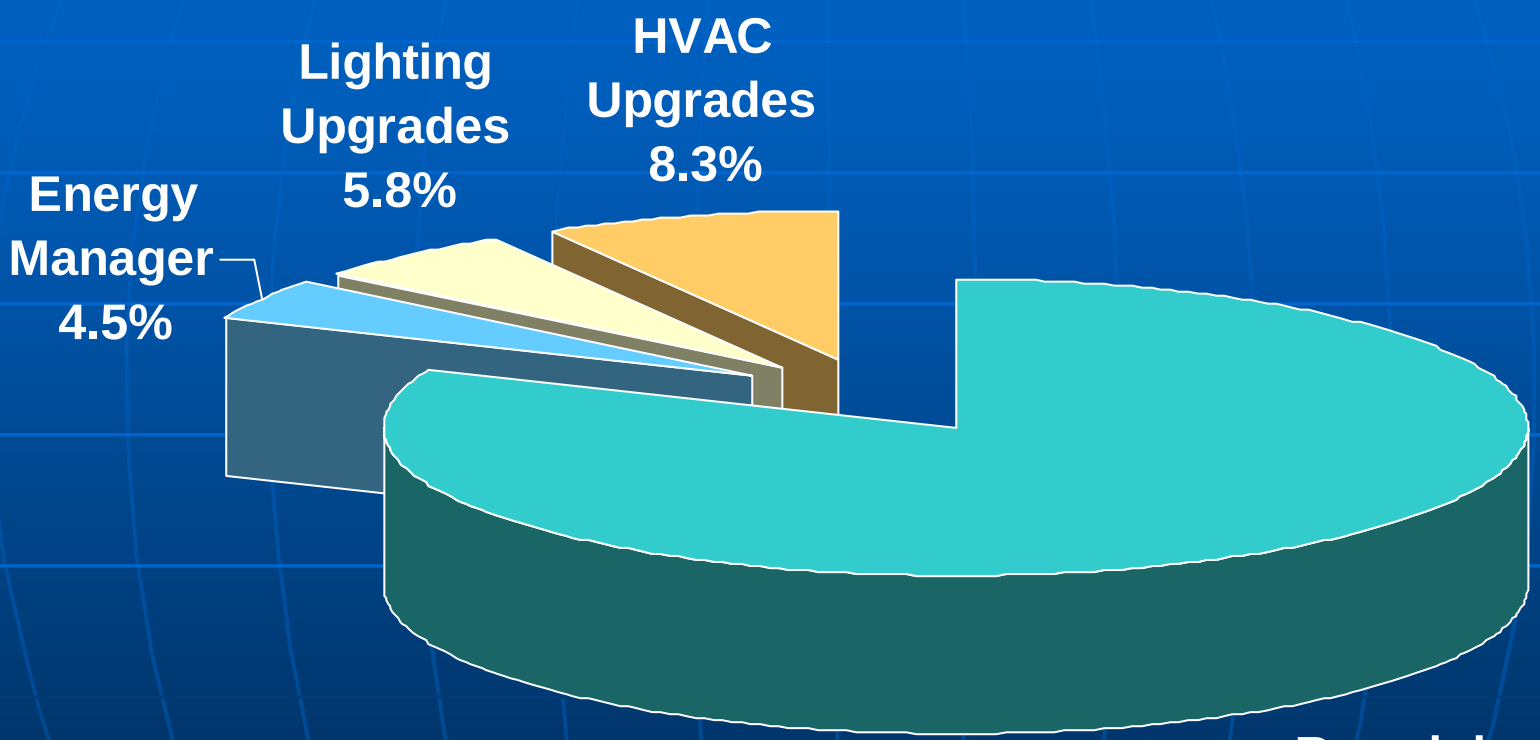
Council Purposes

- Approve design and technology guidelines
- Award grants and/or loans to systems for qualifying projects
- Conduct a verification of the energy efficiencies achieved.
- Establish and support on-going energy management
- Utilize a technical advisory committee to establish energy efficient design and technology guidelines and on-going review.

Technical Advisory Committee

- 7 highly qualified, very technical members
  - ORNL, TVA, professional engineers, sustainable building design experts, a public power expert.
  - ORNL and TVA chair the committee
- Will provide the substance
  - Establish the design and technology guidelines
  - Create methodology for post-audit verification of energy efficiencies achieved
  - Commissioning verification controls (are people using the technology correctly)

Where Do Savings Come From?



Current Use = $155 million / year

Savings Potential @ 18.6% = $29 million / year